

REMARKS

These remarks are in response to the Office Action mailed April 6, 2004. Claims 1-3, 12-13, 15, 17 and 24 have been amended. Support for the amendment to claims 1 and 2 can be found, for example, at page 3, paragraph 0007, at page 11, lines 2-4, and original claim 3. New claims 25-28 have been added. Support for the new claims can be found throughout the specification as filed. For example, support for the claims can be found in claims 2 and 3 (as originally filed). Accordingly, no new matter has been introduced.

I. REJECTION UNDER 35 U.S.C. §103

Claims 1-24 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over Woiceshyn, Wycech (the '545 patent and the '902 patent), Garrett (of record) or Darvell et al. Applicants respectfully traverse this rejection with respect to the pending claims.

Applicants submit that prior syntactic foams are a lightweight composite material made from glass microspheres in a polymeric resin binder phase ("wet microspheres"), along with other fillers and additives. A binder phase is cross-linkable and comprises a resin that is typically a polymer. The binder phase becomes cross-linked upon exposure to a hardener (e.g., an activator such as UV light or other cross linking agents). The two components (the binder and the hardener) are cured (i.e., cross linked) to form a rigid polymeric material. Typically syntactic materials include rigid binder phases. Rigid binders are used in syntactic foams to add support and reinforcement to glass microspheres, giving greater strength for a given density.

However, as pointed out in the specification at paragraph 0006, the use of binders causes rigidity resulting in cracking, particularly under thermal shock and cycling. The most common rigid binder resin choice is epoxy, because of its strength and resistance to hot, wet conditions. The choice of hardener may be either anhydride or amine curing agents, each of which has advantages and disadvantages.

Applicants' invention utilizes expandable microspheres in a "dry" state (i.e., in the absence of a binder) to create foam constructs (see, e.g., page 20, paragraph 0053). The foam product does not have the cracking or rigidity difficulties of prior syntactic foams.

Woiceshyn teaches that once the microspheres are dispersed in the resin "The resin binder. . . is then cured, holding filaments apart and creating bulkier stiffer yarn and fabric." (See, e.g., col. 5, lines 8-10; col. 6, lines 23-30 and line 50-54; and col. 7, Example 3). Applicants' claimed invention recites that the foam lacks a binder phase (i.e., it is "dry"). Furthermore, Applicants' specification teaches that in one embodiment the fibrous matrix can be treated with a binder phase, however, such binder phase is dried and cured prior to contact with the microspheres (see, e.g., paragraphs 66 and 67 of Applicants' specification). In additional embodiments, no binder is used in any component of the foam or the foaming process. Thus, in one aspect of the invention binder is used to tack fibers at crossover points only. Applicants' invention does not use a binder to bind microspheres to each other, or to bond microspheres to fibrous component.

The Wycech specifications are the same as the '545 patent is a divisional of the '902 patent. Referring to Wycech '545, Wycech teaches that unexpanded, thermally-expandable microspheres are added to a liquid epoxy resin or prepolymer (see, e.g., col., 5, lines 48-51). The liquid epoxy resin or prepolymer is cross-linked or cured with a hardener that is "compatible with the thermosetting resin (see, e.g., col. 7, lines 42-50). Thus, the microspheres in Wycech are "wet" or have a "binding phase". This is contrary to Applicants' invention.

Darvall teaches at col. 14, that a "syrup" is mixed with microbubbles and then polymerized with and HDDA cross-linker. Thus, the microbubbles are "wet" and have a binder phase. This is contrary to Applicants' claimed invention.

Garrett further teaches the use of a "wet" microsphere preparation comprising a binder phase. Applicants submit that Garrett is cumulative to the foregoing references.

Furthermore, Applicants submit that none of the cited references teach or suggest the methods of claims 12-24. None of the cited references teach expanding microspheres in a closed mold.

Based upon the foregoing, Applicants respectfully submit that the cited references, either alone or in combination, do not teach or suggest each and every element of Applicants' claimed invention. Accordingly, Applicants respectfully request withdrawal of the \$103 rejection.

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II. REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claims 1-24 stand rejected under 35 U.S.C. §112, second paragraph as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse this rejection.

The Office Action alleges that claim 1 is indefinite because it calls for a foamed composition and it is not clear from where said foam is derived. Applicants respectfully submit that one of skill in the art would understand the meaning of foam and that the elements recited in claim 1 are elements of such foam. For example, one of skill in the art understands the term "syntactic foam" as seen throughout the literature. Accordingly, Applicants respectfully request withdrawal of the rejection.

Enclosed is a \$79.00 check for excess claim fees. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: _____

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